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Factsheet

FARM FENCING SYSTEMS

(Replaces Factsheet, "Farm Pasture Fencing", October 1984)

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A variety of farm fencing systems are available today to choose from when confining or excluding various kinds and sizes of livestock. Although most of the fencing types can have many applications on the farm, often there is one type that can be best adapted to a specific function. New fencing types have been introduced over the past few years. This factsheet discusses the various fencing systems available, their application and approximate costs. Further information on a specific fencing type may be obtained by consulting a publication listed under "Additional References" at the conclusion of this Factsheet or by discussing the proposal with a supplier.

FENCING TYPES

1. Page Wire

Page wire fencing is considered a permanent fencing type usually constructed on the farm/field perimeters to control livestock, protect crops and enclose pastures. Although there are a range of fence heights and horizontal wire spacings, the 9 strand, 48 inch (1200 mm) high fence is very popular. The actual selection of fence height and spacing will depend upon the type of livestock to be excluded. Often, a single strand of barbed wire is installed on the posts above the page wire fencing, especially where animals, i.e., horses, tend to reach over the fence. Anchor, corner and stretch posts must be wood, but line posts may be wood or steel. Use either a long lasting wood post such as cedar or a pressure-treated post for maximum life. Post spacings will vary from 12-16 feet (3.7-4.8 m). Post lengths will depend upon the choice of page wire fencing height; normally, an 8 foot (2.4 m) long post with approximately 5 feet (1.5 m) of post above ground is required to exclude cattle and horses.

Page wire fencing is a permanent fencing system that is very visible to the animals being excluded. On the other hand, this fence is costly to purchase and results in higher installation costs due to increased labour requirements and more equipment and material necessary at the site for construction.

2. Barbed Wire

This fencing type is the more traditional barbed wire fencing consisting of 4 strands of barbed wire stretched on posts approximately 16 feet (5 m) apart. Either the standard double-strand type wire or the newer single-strand type may be used. The single strand is cheaper, slightly stronger and it has more barbs. The barbed wire is stretched tight during installation and stapled securely to each post. This 4 wire fencing system normally would have the bottom wire 12 inches (300 mm) above the ground and each wire above spaced 10-12 inches (250-300 mm) depending on the animals being excluded.

A barbed wire fence would be used where a greater repelling action against livestock is required. In comparison to other fencing types, it is hard to handle because of the barbs and is more susceptible to permanent damage, sagging and failure because it is tightly stapled at each post. A 4 wire fence will not have close enough spacing on the wires for small animals. The barbed wire fencing system may also contribute to an increased risk of wildlife injury.

3. Suspension (High Tension)

The suspension fence is based on wires moving freely between the posts. A whipping action is created along the fence following impact by an animal. This discourages animals from reaching through the fence. Very little of the weight of the wire is on the post. The brace posts absorb the force. Posts are placed up to 90 feet (27 m) apart on level ground. Metal or wooden droppers are placed at 15 foot (4.5 m) intervals. The droppers space the wires along the fence line.

The suspension fence is most effective on level land. It has limited application on rough land. It is faster and less expensive to construct than page wire.

Single strand barbed wire and 12.5 gauge smooth wire are used. Both types require little upkeep. Cheaper than page wire, the bottom wire is usually located 12 inches (300 mm) off the ground.

(a)Smooth Wire (Suspension) (12.5 Gauge High Tensile)

This is usually a fence of five wires or more. It has more elasticity than barbed wire. It is easy to install with the use of a wire spinner. One or two wires are sometimes electrified. It is often used where electric fence isn't suitable such as urban areas. Smooth wire is stronger and easier to install than barbed wire.

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Smooth wire may not be as effective in controlling cattle because of the lack of barbs.

(b) Barbed Wire (Suspension)

Barbed wire can be more effective in controlling some animals than smooth wire.

However it is more time consuming and tedious to put up. Barbs will catch on the staples reducing the whipping action. There is also a safety concern for both the fence builder and the animals. Barbed wire should never be electrified.

4. Electric Fence

Electric fencing can be built as a permanent or non-permanent fence (Figure 1). The life of a page wire or rail fence can be extended by using electric fencing. The high cost and labour involved with putting up and maintaining traditional fences has made electric fencing more attractive. When properly constructed modern electric fencing is much more dependable than older style battery operated units used in the past.

Proper grounding and fence maintenance are important for the fence to carry an effective charge. A backup power source is something to consider. Check with municipal bylaws for regulations on electric fencing.

Training

This type of fence is a psychological barrier rather than a physical barrier. The success of electric fencing depends on the livestock being trained to the fence. Place a charged wire inside the barnyard fence and leave the livestock here a few days to let them learn about electric fences before putting them out to pasture.

How Does It Work?

A power source, either hydro or battery operated, is needed to provide a shock. Wire is used to carry the current out along the fence and a ground completes the circuit.

An electric fence line with no vegetation touching it requires very little power to maintain high voltage levels. Normally, the fence will have some plant growth to handle, referred to as the fence load. Every plant in contact with a live wire will draw a small amount of current to the ground. With miles of wire this drain can reduce the effectiveness of the fence.

(a)Permanent Electric Fence

Permanent electric fence has two or more 12.5 gauge high tensile wires. Number of wires will depend on the type of animal being confined. A predator control fence will require more wires. Posts may be placed at 50 feet (15 m) with droppers at 25 feet (7.5 m).

(b) Non-Permanent Electric Fence

A non-permanent electric fence is often used for subdividing a field for pasture rotation. Polywire, 14 or 16 gauge smooth wire or polytape are suitable for temporary fencing. This fence is easy to set up and take down. Plastic or fibreglass posts are quite suitable.

5. Cedar Rail

The Cedar rail fence is our traditional fence with a number of styles in use. A supply of rails is needed along with the skills to construct it. In parts of the province, rails are still plentiful. Construction can be time consuming but the price is right with personal labour. Some styles sit on top of the ground and work well on shallow soils or stony ground. Wind can be a problem in open areas.

With heartwood from the cedar tree some rail fences have lasted for a generation or two.

In recent years rail fences are often reinforced with a strand of barbed wire or electric wire.

BRACE ASSEMBLIES

Corner and end brace assemblies are the foundation of the fence. An entire fence may fail if the brace assembly is not adequate. Suspension fencing relies totally on the brace system to provide support.

The brace assembly shown (Figure 2) has been found to be the most popular. This design has adequate strength, is

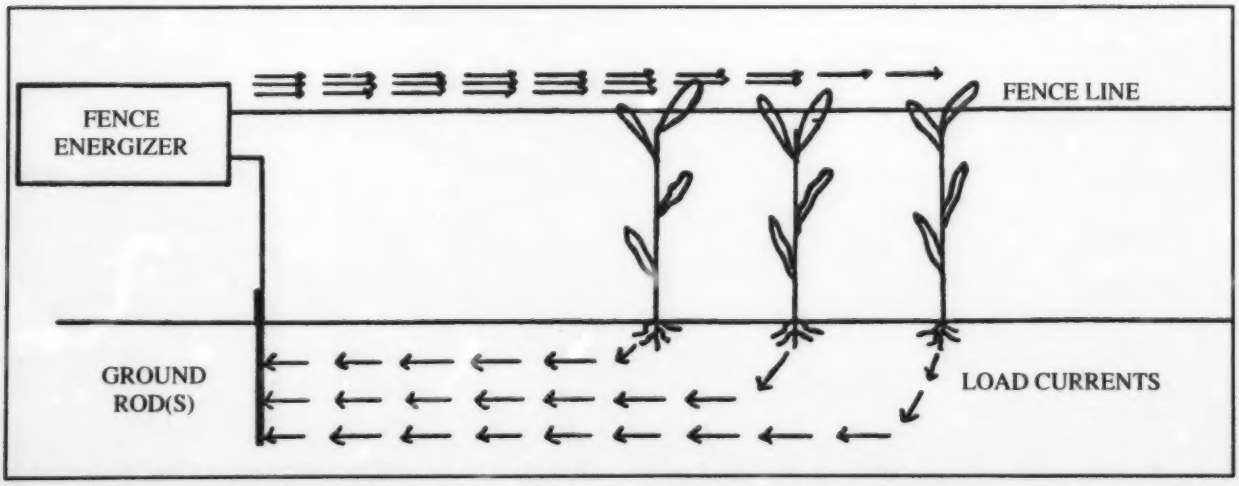

Figure 1. An electric impulse travels from the energizer along the wire to plant or animal to ground to ground rods and back to ground post on energizer. (Diagram courtesy of Winterburn Enterprises)

easy to build and is aesthetically pleasing. For a strong brace assembly, 5 inch (125 mm) top diameter brace posts are used and driven 4 feet (1.2 m) into the ground in firm soil and deeper yet in soft soil. A top horizontal brace should be twice as long as the height of the post above ground but never less than 8 feet (2.4 m). A twitch or brace wire is installed diagonally between the posts.

For fences of six wires or less, a single-span assembly is quite satisfactory with the exception of sandy soil locations.

The double-span assembly (Figure 3) is stronger than the single-span if it is constructed correctly. It need only be used as a bracing system if the fence has more than 6 wires or if soils have very poor cohesive properties such as sand.

An in-line brace (an end brace, but used elsewhere along the fence) should be installed at maximum intervals of 1300 feet (400m). Shorter intervals may be necessary to maintain wire spacing and strength if the terrain is rough.

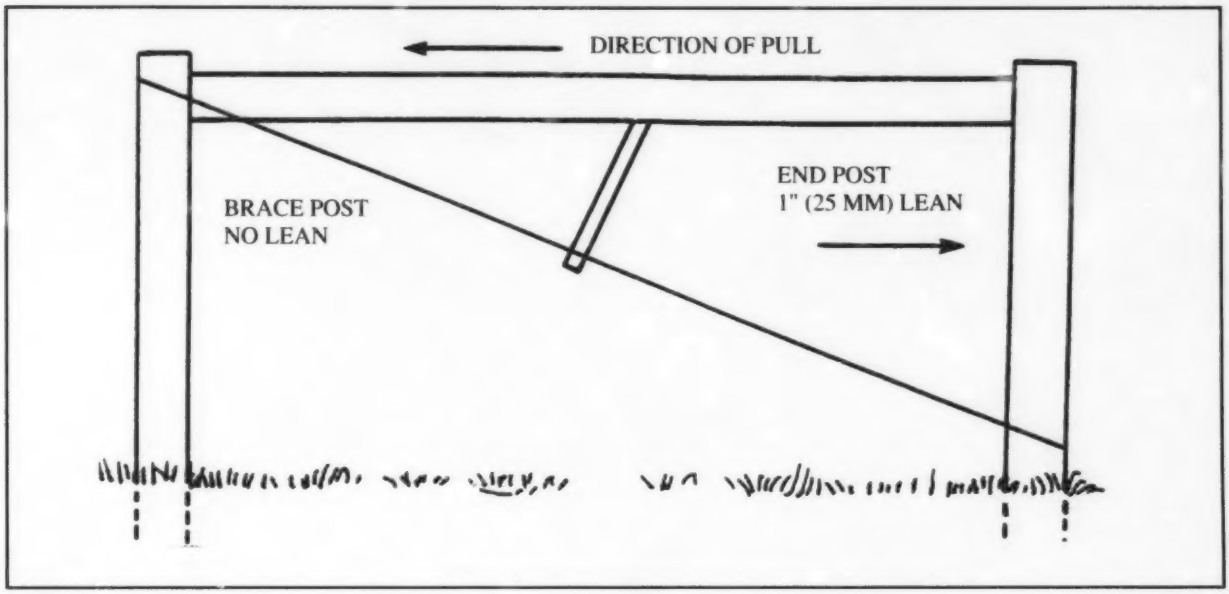

Figure 2. Single-Span Brace Assembly

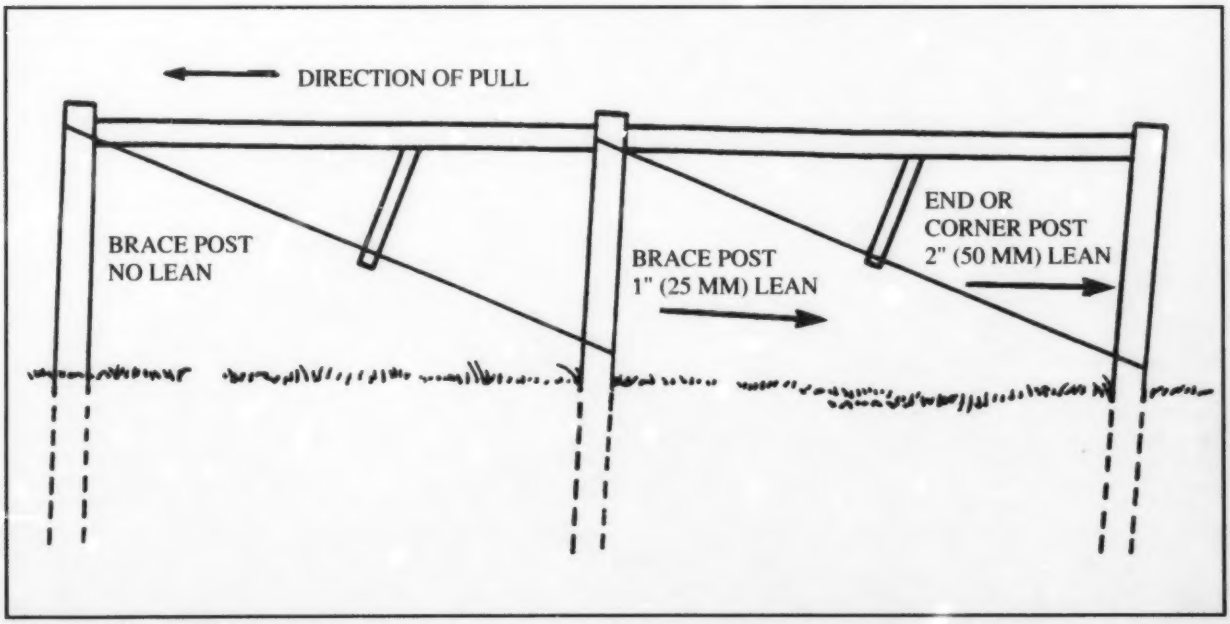

Figure 3. Double-Span Brace Assembly

FENCING COSTS - FALL 1991

80-rod (1/4 mile)

	Page Wire 9 strand		Standard Barbed Wire 4 wires		Suspension Smooth Wire 12.5 gauge 5 wires		Suspension Barbed Wire Single strand 4 wires		Electric Permanent 12.5 gauge 2 wires		Cedar Rail Fence	
	Amount	Cost	Amount	Cost	Amount	Cost	Amount	Cost	Amount	Cost	Amount	Cost
Cedar 8" posts @ $9.00	6	$54.00	6	$54.00	6	$54.00	6	$54.00				
Cedar 5" posts @ $6.00	24	$144.00	79	$474.00	14	$84.00	14	$84.00	30	$180.00		
Steel posts @ $6.25	55	$343.75										
Page wire @ $8.50/rod	80	$680.00										
Barbed wire @ $58.00/80 rod, (double strand, 12.5 gauge)			320	$232.00								
Barbed wire @ $41.50/80 rod (single strand, 12.5 gauge)							320	$166.00				
Smooth wire @ $41.50/80 rod (12.5 gauge, high tensile)					400	$207.50			160	$83.00		
Insulators @ $.33									60	$19.80		
Staples @ $1.00/lb,1.75 in.	7	$7.00	18	$18.00	4	$4.00	4	$4.00				
36-inch wire stays @ $1.49					60	$89.40	60	$89.40				
Droppers-$2.90									28	$81.20		
Energizer @ $300									10%	$30.00		
Total Materials		$1,228.75		$778.00		$438.90		$397.40		$394.00	–	
Labour @ $16.00/hr.	80	$1,280.00	70	$1,120.00	20	$320.00	30	$480.00	15	$240.00	$650.00	
Total Cost/80 rod		$2,508.75		$1,898.00		$758.90		$877.40		$634.00	$650.00	

Additional References
OMAF Factsheets
Fencing of Watercourses to Control Erosion, Agdex 751

Canada Plan Service Leaflets
Page Wire Fencing, Plan # M-8365
Barbed Wire Field Fencing, Plan # M-8366
Barbed Wire Suspension Fencing, Plan # M-8367

Agriculture Canada Publication
Wire Fences for Livestock Management, Publication # 1848/E

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